exceed the rate of 120 miles an hour, but this is only in puffs of a few seconds' duration, as the total movement of the wind for a whole hour rarely exceeds 60 miles. Now, wind pressure is usually estimated at 2 pounds per square foot of surface when blowing perpendicular to that surface with a velocity of 20 miles per hour, 8 pounds for 40 miles, and 18 pounds for 60 miles, the pressure increasing as the square of velocity. [It will be observed that during the Gulf storm of September 26–27, 1906, the wind maintained a velocity of 70 miles at Pensacola for a whole hour.] If we assume the highest velocities and calculate the pressures by this rule, we should expect few ordinary houses to resist them. But in the wake of a storm, a study of the structures which fail and of those which resist is generally calculated to surprise an observer far more by the apparently weak ones which have resisted the winds than by the apparently substantial ones which have failed. And when those which have failed are examined, it will be found, almost invariably, that failures are due to unstable foundations or to lightly attached roofs. In fact, it may be taken as a measure of the force of hurricane winds that the frame of any ordinary house will resist them. But the foundations must be firm and the roofs fairly well framed and attached. In new houses, by the use of wooden ceilings instead of plastering, and a few angle irons and bolts, one can easily have a structure like a double box, which could be almost rolled over without injury. Old houses, badly constructed and with poor foundations, may be easily preserved by a few stout braces or inclined props on sides opposite the wind. In short the wind of a cyclone by itself seldom works serious injury. It is only where it has the water as an ally and accumulator of its forces that its ravages are great. When a hurricane passes inland it soon becomes little more than a bit of very bad weather. Its great instrument of destruction is the so-called tidal wave or storm tide, or, more properly, storm wave, which is raised by it and which submerges the low land of the coast. Below the limit to which these waves rise is the zone of danger in a hurricane; above it is the zone of easily attained safety.

How far this danger line may extend above ordinary high water depends so largely upon local configuration of coasts that it is only to be determined for any locality by observation. Unfortunately reliable measurements and data upon this point are rare and difficult to obtain. Popular accounts are always exaggerated, being largely based upon the action of surface billows, which send water and drift far above the general level of the storm wave. A vessel, for instance, drawing eight feet may be carried by successive billows across a marsh submerged only four feet beneath the general level. I have read accounts of combined storm waves and high tides rising ten or twelve feet above ordinary high-water mark, but when the action of billows is eliminated and careful measurements are made, the highest record of a storm tide above ordinary high water which I have been able to find anywhere is 8.2 feet. This limit was reached at Fort Pulaski, Ga., in the great gale of August 27, 1893, which broke all records in the height of its waters, in the destruction of life and property, and in the measured velocity of its wind, which at Charleston, for a few moments, exceeded 120 miles an hour. As this gale is one of great interest, the reader is referred to the records published in the MONTHLY WEATHER REVIEW for October, 1893, page 297.

The following table shows the rise of the tide caused by this hurricane, and for comparison, also, the highest storm tides ever recorded at several Gulf, Atlantic, and Lake ports, as shown by records of the U. S. Coast Survey and Engineer offices.

Highest storm tides at various points.

Locality.	Date.	Height of tide.	Moon's age.
		Feet.	*Days.*
Boston, Mass.	April 16, 1851	5.3	15
Sandy Hook, N. J.	September 10, 1889	3.9	14
Fort Monroe, Va.	March 10, 1846	5.1	12
South Island, S. C.	October 13, 1893	6.8	2
Fort Sumter, S. C.	August 27, 1893	6.4	14
Fort Pulaski, Ga.	August 27, 1893	8.2	14
Mobile, Ala.[3]	October 2, 1893	7.0	20
Buffalo, N. Y.	January 9, 1889	8.0	6
Duluth, Minn.	September 28, 1895	4.0	9

The plane of reference is ordinary high water, and the age of the moon is given in each case to indicate whether the storm tide coincided with the normal high tides, which occur at all Atlantic ports about each full or new moon. There is no tide at Lake ports, and but little in the Gulf.

From the above we see that the serious ravages are committed by the water rather than by the wind, and that they are confined to a narrow zone seldom, if ever, reaching more than eight or nine feet above the plane of ordinary high water. Above that zone ordinarily well built houses will easily resist the winds if the house and the roof are securely framed together and the foundations are stable. If there are weak points, even cheap and ordinary props or braces which can be improvised rapidly, are very effective in breaking up vibrations and resisting the pushes and shakes of the wind. Within the zone of danger from water, the dash of the waves and the tendency of the water to lift and float all wooden structures must be provided for. The limits of this article do not permit a full discussion of the magnitudes of these dangers and the various means by which they may be met, but it may be said briefly that pile foundations, or the equivalent, posts framed into buried timbers, are at once cheap and efficient.

[3] The tide of September 27, 1906, at Mobile, is reported to have been about one foot higher than that of 1893.—*E. B. G.*

WEIGHT OF SLEET ON SUSPENDED WIRES, CABLES, AND BRIDGES.

The breakage of telegraph lines and cables by the weight of the accumulated sleet, ice, and snow led us some years ago to ask that observers send to the MONTHLY WEATHER REVIEW some observations on the weight of sleet actually observed in ordinary and extreme cases. We now renew the request. Please state the size of wire, or cable, and the weight of ice per linear foot.—*C. A.*

RAINY OR SNOWY WEATHER AS FORETOLD BY HALOS.

It is a well-known fact that rain, snow, and general storms are frequently preceded by the appearance of halos, and especially simple circles around the sun or moon. The relation between these phenomena has been carefully studied in Europe, but I know of nothing especially bearing on this subject in America. Would not many of our observers, both regular and voluntary, do well to look over their past records, and tabulate the dates and hours on which halos were observed, more especially the 22-degree and 45-degree circles around the moon and the sun, with a statement of the weather that followed twenty-four hours later? Doubtless the halo will be a much better guide in predicting the weather in some places than in others.—*C. A.*

MONTHLY REVIEW OF THE PROGRESS OF CLIMATOLOGY THRUOUT THE WORLD.

By C. FITZHUGH TALMAN, U. S. Weather Bureau.

PUBLICATION OF CLIMATOLOGICAL RETURNS FOR THE BRITISH COLONIES.

It appears from a recent report of the British Meteorological Committee[1] that a proposition to provide for the publication, in convenient and accessible form, of the abundant climatological data now accumulating in nearly all the British colonies was recently considered by the Committee, and rejected on the score of expense. Following are extracts from a correspondence on this subject that past between the Colonial Office and the Treasury, which latter now has control of the Meteorological Office thru the newly constituted Meteorological Committee:

Letter from the Colonial Office to the Treasury.

DOWNING STREET,
5th August, 1905.

SIR: I am directed by Mr. Secretary Lyttelton to request you to inform the Lords Commissioners of the Treasury that as the result of an enquiry from the United States Weather Bureau for meteorological information with regard to Weihaiwei, he has had his attention drawn to the absence of any organization for the collection and publication of meteorological returns from the colonies generally, and for affording information to persons making enquiries as to climatic conditions in various parts of the British Empire.

It would appear that to a great extent in response to a circular of the 27th of July, 1895, the Meteorological Office receive a considerable amount of information, as shown in the enclosed print, which could with a little trouble be largely increased. Owing, however, to the want of the necessary clerical assistance most of these valuable returns serve

[1] Great Britain. Meteorological Office. First Report of the Meteorological Committee to the Lords Commissioners of His Majesty's Treasury, for the year ended 31st March, 1906. London, 1906.